ABSTRACT

The present invention aims at realizing a PDP and a mercury-free fluorescent lamp feasible to maintain excellent luminescent characteristics over long periods by suppressing time-lapse changes in luminescent characteristics of a phosphor that is excited by vacuum ultraviolet light to thereby emit light. To accomplish this object, the oxide phosphor of the invention comprises individual particles, each of which has a region at and near the surface thereof modified, and the elemental composition of the surface region is in a more oxidized state than that of the internal region of the particles. Alternatively, the surface region has more halogen or chalcogen in the elemental composition. In the phosphor treatment method of the invention, the surface region of individual phosphor particles is selectively modified by (i) forming a highly reactive gas atmosphere by exciting gas which contains reactive gas, and (ii) exposing the phosphor to the gas atmosphere.